

**REMARKS**

Entry of the foregoing and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

Claims 1-14 were pending in this application. In this response, claims 2-7 and 11-12 are amended, claim 1 canceled and claim 15 added. Thus, claims 2-15 stand pending.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims and the specification, page 5, paragraph 22 and page 6, paragraph 29.

**REJECTIONS UNDER 35 U.S.C. § 103**

Claims 1-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,585,864 to Fisher et al. (hereafter "*Fisher*") in view of U.S. Patent No. 4,535,034 to Zaizen et al. (hereafter "*Zaizen*") and further in view of U.S. Patent No. 4,752,599 to Nakamura et al. (hereafter "*Nakamura*") for the reasons presented at pages 2-4 of the Official Action.

Applicants respectfully traverse the rejection. Claim 2 recites "coating an austenitic substrate alloy with at least one layer of a composition having an Al content of at least 75% by weight . . . wherein the layer of a composition having an Al content of at least 75% by weight is in direct contact with the austenitic substrate alloy." *Fisher* fails to disclose at least this combination of elements.

*Fisher* discloses coating an overlay coating directly on a substrate or with an intervening diffusion coating between the substrate and overlay coating. *See, e.g.*, col. 4, ll. 21-44. Further, *Fisher* discloses optionally coating a layer of aluminum on the overlay coating. *See, e.g.*, col. 4,

II. 36-40. However, *Fisher* fails to disclose coating a layer having an Al content of at least 75% by weight directly on the substrate. Specifically, the aluminum layer does not directly contact the substrate, and neither the overlay coating nor the diffusion coating contain Al at a concentration of at least 75% by weight.

The overlay coating has a composition of MCrAlX where the Al concentration is preferably only 8 to 13% and the M component makes up the majority of the coating. *See, e.g.*, col. 5, ll. 25-29. The diffusion coating has Si as the largest component and an Al content of 35-45%. *See, e.g.*, col. 5, ll. 39-49. Therefore, neither of the two layers described in *Fisher* that optionally directly contact the substrate have an Al content of at least 75%.

Neither *Zaizen* nor *Nakamura* remedy at least the above mentioned deficiency of *Fisher*. Although *Zaizen* and *Nakamura* each allegedly discloses aluminum-based alloy coatings, one of ordinary skill in the art would not have expected them as substitutes for either the overlay coating or diffusion coating of *Fisher*. One of ordinary skill in the art may have expected success in substituting the aluminum-based alloy coatings of *Zaizen* or *Nakamura* for the aluminum layer of *Fisher*. However, as explained above, the aluminum layer of *Fisher* is not in direct contact with the substrate. There would have been no expected success in substituting the aluminum-based layers of *Zaizen* or *Nakamura* for the overlay or diffusion coatings of *Fisher*, at least because for the overlay coating to have the desired properties it must contain a majority iron, nickel or cobalt and for the diffusion coating to have the desired properties it must contain a high Si content.

Further, any modification of *Fisher* to eliminate the overlay coating or to place an aluminum coating between the overlay coating and the substrate would render *Fisher*

unsatisfactory for its intended purpose. The MPEP notes that a combination of references resulting in a prior art reference being unsatisfactory for its intended purpose is improper. See, MPEP § 2143.01. Specifically, *Fisher* requires the MCrAlX coating to impart beneficial properties to the substrate, and thus elimination of the layer would render *Fisher* unsatisfactory for its intended purpose. *See, e.g.*, col. 3, ll. 64-67. Further, *Fisher* discloses that the aluminum layer is coated on the top surface of the MCrAlX coating to aluminize the MCrAlX coating so as to provide improved oxidation and corrosion resistance. *See, e.g.*, col. 3, ll. 29-47. If the aluminum layer were placed below the MCrAlX layer, then the aluminum layer would not provide the aluminizing affects on the MCrAlX coating to meet the desired purpose of *Fisher*.

For at least the above reasons, no *prima facie* case of obviousness has been established for claim 2. Dependent claims 3-14, which depend from claim 2, are also not obvious for at least the reasons for claim 2. Accordingly, Applicants respectfully request withdrawal of the rejection.

Claims 1-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,693,368 to Ackerman et al. (hereafter “*Ackerman*”) in view of U.S. Patent No. 6,730,264 to Cao (hereafter “*Cao*”) and further in view of *Nakamura* for the reasons presented at pages 4-5 of the Official Action.

Applicants respectfully traverse the rejection. Whether a claim is obvious is based on an objective analysis of the scope and content of the prior art, the differences between the prior art and each element of the claimed invention, and the level of skill in the pertinent art. *See Graham v. John Deere Co.*, 383 U.S. 1, 15-17 (1966). The Office’s objective analysis of obviousness

should be made explicit. *See KSR Int'l Co. v. Teleflex, Inc.*, 82 U.S.P.Q.2d 1385, 1396 (2007); *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”).

Claim 2 recites “wherein the austenitic alloy has the following composition (in % by weight): . . . 0-2 % of Nb, 0-0.5 % Ti.” As admitted by the Examiner, *Ackerman* fails to disclose specific compositions for the substrate, but does disclose examples of commercially available substrates. The Examiner alleges that specifically Inconel 718 is described in *Cao* as Alloy 718. Alloy 718 as described in *Cao* includes 4.75-5.5 wt% niobium plus tantalum and 0.65-1.15 wt% titanium. *See, e.g.*, col. 1, ll. 65-66. Therefore, there is no evidence that *Ackerman* discloses coating on a austenitic substrate alloy having the composition recited in claim 2. Neither *Cao* nor *Nakamura* remedy at least this deficiency.

Specifically, *Cao* discloses high niobium content of at least 4 wt%. *See, e.g.*, col.3, ll. 42-43. *Nakamura* is relied upon solely for its disclosure of aluminum coatings. Further, there is no rationale provided to support the conclusion that there would have been an expectation of success or predictable results from modifying the substrates of *Ackerman* to contain substantially lower niobium and titanium concentrations.

For at least these reasons, no *prima facie* case of obviousness has been established for claim 2. Dependent claims 3-14, which depend from claim 2, are also not obvious for at least the reasons for claim 2. Accordingly, Applicants respectfully traverse the rejection.

Furthermore, claim 15 further recites “wherein the coating of the at least one layer of a composition having an Al content of at least 75% by weight is by PVD.” *Ackerman* discloses

coating by CVD. *Cao* and *Nakamura* fail to remedy at least this deficiency. *Cao* fails to disclose coatings, and *Nakamura* fails to disclose coating an aluminum layer onto the substrate by PVD. Therefore, claim 15, and the claims that depend therefrom, are unobvious for at least this additional reason.

#### ***CONCLUSION***

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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